



# Air Force Research Laboratory|AFRL

*Science and Technology for Tomorrow's Air and Space Force*

## **Success Story**

### **AFRL SUCCESSFULLY DEMONSTRATES JOINED-WING TECHNOLOGY**



The joined wing provides a long-endurance, high-performance platform capable of supporting a next-generation sensor suite to perform Air Force intelligence, surveillance, and reconnaissance (ISR) missions. The joined-wing vehicle configuration is a high-altitude and long-endurance concept that provides natural 360° radar coverage with conformal load-bearing radar systems imbedded in a multifunctional structural technology wing structure.



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### **Accomplishment**

AFRL successfully completed the first flight test of a 7% scale, joined-wing technology demonstrator. During the test, a small unmanned air vehicle with joined wings completed several takeoffs and landings that culminated with a 2-minute run in which the vehicle took off, circled, and landed in the spot where it took off. Engineers will use the flight test data to incrementally improve the scaled vehicle's design. Ultimately, AFRL envisions a new, aeroelastically scaled research vehicle as a way to explore gust load alleviation devices and consequently, structural weight reduction.

### **Background**

The joined-wing vehicle concept has two wings on the fuselage that sweep back to meet two forward-swept wings originating from the tail area. Viewed from above, the wings form a diamond shape. Joined wings would be ideal for the SensorCraft concept; their shape would allow powerful 360° radar to be incorporated into the SensorCraft's wings. Not only would this antenna placement free space on the vehicle's body for other equipment, it would also give the radar a virtually unobstructed view of the surrounding environment.

AFRL is developing the SensorCraft concept as a tool to investigate how emerging technology for sensors, communications links, air vehicle components, and propulsion systems could be incorporated to create the next-generation ISR vehicle. SensorCraft will help engineers determine the joined-wing vehicle's viability.

### **Additional Information**

To receive more information about this or other activities in the Air Force Research Laboratory, contact TECH CONNECT, AFRL/XPTC, (800) 203-6451 and you will be directed to the appropriate laboratory expert. (05-VA-06)